

## The Comparence of 4 Industrial Ethanol Producing *Saccharomyces Cerevisiae* Strain in Synthetic and Industrial Media

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**Background & Objectives:** *Saccharomyces cerevisiae* can have four fermentation pathways in different conditions, and the most important one is Alcoholic fermentation. For several industrial applications and the reservation of potential energy of glucose in ethanol product, this metabolite is one of the valuable materials for different industries and even is considered as better fuel. Other way molasses is an adequate source for producing Ethanol, because it has large amount of sugar in Iran. In laboratory surveys of ethanol fermentation, those culture media which their N & P sources are yeast extract and pure material salt are usually used. But is it possible to apply the results of these laboratory surveys in industry, and will the strain in laboratory synthetic media which have highest productivity, function similarly in industrial media?

**Methods:** To measure this thesis, 4 industrial strains compared in synthetic and industrial media. The synthetic media are consistent of cane molasses 15 brix (sugar concentration: 95 g / l), yeast extract 5 g/l, ammonium chloride 1.5 g/l, magnesium sulphate 4 g/l, potassium chloride 1.7 g/l and potassium dihydrogen phosphate 5 g/l. For preparing the industrial media, at first the sugarcane molasses of Khuzestan and the industrial sources of Nitrogen & Phosphate were analyzed. Then, based on the components of molasses and purity percent of the source of Nitrogen & Phosphate and also the general formulation of yeast, the component of culture media according to the productive industries was calculated. (The C & N and P sources were selected according to industrial plant sources exactly). The mentioned cultures media are consistent of cane molasses 15 brix (sugar concentration: 95 g / l), industrial urea (2 g/l), industrial ammonium sulphate (2 g/l) and diammonium phosphate (3 g/l). Then inoculated 2% v/v of preculture media. Sampling of the culture media was done in 4 hours intervals and under the sterile condition. The production of ethanol and the consumption of sugar were measured. Ultimately the quantity of the yield, efficiency and productivity were computed and analyzed in ANOVA analysis.

**Results & Conclusion:** The results of this study showed that for all studied 4 strains in industrial media compared with synthetic media, yield, efficiency and productivity quantity decreased, that indicates the importance of N & P source difference in these media. It is worth mentioning that strain 4, has higher yield, efficiency and productivity in the synthetic media in compared to strain 3, however, strain 3 preceded the strain 4 in industrial media, which indicates in adaptive ability of the strains in relevance to industrial media. Therefore, by investigating for one strain in synthetic media, the amount productivity can not be found in industry, and it is more effective to use identical media with industrial media to screen industrial strain and investigate their adaptive ability.

**Keywords:** Alcoholic Fermentation; *Saccharomyces Cerevisiae*; Sugarcane Molasses; Adaptive